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PRELIMINARY DRAFT

TRAFFIC AND CIRCULATION PLAN

MAJOR STREETS IN THE SOUTH BOSTON GNRP AREA

February, 1963

WILBUR SMITH AND ASSOCIATES

Consulting Engineers

Wilbur Smith and Associates

TRAFFIC • PARKING • TRANSIT • HIGHWAYS

495 ORANGE STREET
New Haven, Conn.

February 8, 1963

Mr. Robert H. Murphy
Principal Transportation Planner
Boston Redevelopment Authority
City Hall Annex
Boston 8, Massachusetts

Dear Mr. Murphy:

Subject: Major Streets in the South Boston GNRP Area

The street pattern for the South Boston GNRP area has been under study for the past few months. The most recent circulation plan, which is included in the GNRP submission by the Redevelopment Authority, incorporates a number of ideas which were developed at earlier meetings and workings sessions with various members of the BRA staff.

After carefully reviewing the plan, we are pleased to submit the following material concerning major circulation needs in the South Boston GNRP area. We trust that this information will prove helpful to you in the development of detailed project plans for the area.

Very truly yours,

WILBUR SMITH AND ASSOCIATES

Paul E. Conrad

Paul E. Conrad

PEC/bjk

SUMMARY AND CONCLUSIONS

1. The circulation plan included as a part of the GNRP submission makes adequate provision for anticipated 1980 traffic in the area.

2. The proposed new truck route along the railroad tracks east of "A" Street will accommodate most of the heavy truck traffic which now filters through the western part of the GNRP on local residential streets. Traffic hazards will be removed and residential land values will be improved as a result.

The portion of this new route north of First Street outside of the GNRP should be restudied to ascertain if adequate provision has been made for freight terminals and railroad sidings.

Emphasis should be given to First Street as the major feeder for this route.

3. Traffic circulation in the northwest corner of the GNRP (in the vicinity of Dorchester Avenue, Broadway, West Fourth Street and Fort Point Channel) will have to be re-evaluated as project plans are developed, particularly in light of new land use and circulation proposals, adjacent to the GNRP area, which are primarily of a regional rather than a local nature.

4. The treatment proposed for Andrew Square will simplify traffic flows so that they can be controlled satisfactorily with traffic signals.

5. The proposed Atlantic Avenue-Dorchester Avenue Connector should be developed as a high-type arterial, linking Morrisey Boulevard and the Southeast Expressway to downtown Boston. A minimum number of cross streets and driveways should be permitted; grade separations should be provided at major intersections.

Construction of this facility is essential for the proposed plan to function effectively and to divert through traffic from the "L" Street-Summer Street route. To derive the greatest benefit from this new arterial as a relief route for the Southeast Expressway, a more direct connection must be established between Dorchester Avenue and the expressway. This might take the form of a pair of continuous service roads between Columbia Road and Dorchester Avenue or a pair of ramps connecting directly into Dorchester Avenue.

6. A location study should be made for the proposed East Boston-South Boston Tunnel that has been recommended from time to time, and which may be needed by 1975 or 1980; right-of-way for its approaches might thus be set aside during the execution of renewal projects in the GNRP area.

7. Several additional collector streets should be provided to facilitate local circulation within the area, including East Eighth and "G" Streets, and portions of East Fourth, "D", and West Seventh Streets.

MAJOR STREETS IN THE SOUTH BOSTON GNRP AREA

The purpose of this report is to review traffic, transportation and circulation aspects of the South Boston GNRP as presented in the recent submission prepared by the Boston Redevelopment Authority.

In particular, the circulation proposals included in the plan were reviewed in regard to their adequacy to accommodate anticipated 1975-1980 traffic loadings. Where the BRA's staff proposals do not appear adequate, suggestions and recommendations for expanding or modifying the plan were made. The transportation requirements of the GNRP area were also reviewed in relation to the broader regional considerations of the inner or "regional core" area circulation plan being studied concurrently.

The traffic projections and assignments were derived in part from the Boston College Seminar Studies,[1] the Inner Belt traffic study,[2] modified by engineering judgment based on thorough familiarity with the area.

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(1) Seminar Research Bureau, Boston College, Studies of Urban Transportation: Travel in the Boston Region 1959-1980, Boston, Massachusetts, 1960.

(2) Hayden, Harding and Buchanan, Inner Belt and Expressway System, Massachusetts Department of Public Works, Boston, Massachusetts, 1962.

Existing Street System

The existing street system in the GNRP, which is summarized in Table 1, serves present traffic reasonably well. The major streets have adequate capacity for present traffic volumes, although on most speeds are low and delays are frequent.

During peak hours traffic demands exceed the capacity of the Southeast Expressway, which lies just outside the GNRP area. During peak hours, the average speed is approximately 20 m.p.h. and the "breakdown lane", or shoulder, is used as a traffic lane. Consequently, much through traffic in the expressway corridor has once again been forced onto the street system. Unless the capacity of the expressway is increased, or motorists are diverted to rail or bus facilities, a steadily increasing volume of through traffic will be imposed on north-south streets in the South Boston GNRP area. Rail rapid transit service, using the right-of-way or facilities of the Old Colony Division of the New Haven Railroad, has been proposed from time to time since 1907, but adequate financial and political support have so far been lacking.

Summer Street serves the South Boston Freight Terminal area and in combination with L Street and Day Boulevard (the "Strandway") provides a peak-hour bypass of the Central Artery and Southeast Expressway. It is the most heavily traveled street in South Boston.

Dorchester Avenue, in combination with Old Colony Avenue, also is used by potential Expressway traffic during peak periods. Volumes on portions of these two routes presently reach 20,000 vehicles per day. Before the

Table 1

EXISTING MAJOR STREETS
South Boston GNRP Area

Facility	From	To	Direction	Classification	No. of Moving Lanes*	Approximate 1962 Average Daily Traffic	Remarks
Southeast Expressway	Columbia Rd.	Central Artery	N-S	Expressway	3-3	100,000	Breakdown lane used as traffic lane in peak hours.
Summer Street	Dorchester Ave.	First Street	NW-SE	Primary Street	2-2	20,000	Has median divider.
"L" Street	First Street	Broadway	N-S	Primary Street	2-2	10,000	Continuation of Summer Street. No median.
"L" Street	Broadway	Day Boulevard	N-S	Primary Street	1-1	8,000	
Dorchester Avenue	Summer Street	Foundry	N-S	Primary Street	2-2	10,000	Marginal friction near South Postal Annex.
	Foundry	Greenbaum	N-S	Primary Street	2-2	10,000	Southbound traffic underpasses Broadway.
	Greenbaum	Old Colony	N-S	Primary Street	2-2	20,000	Very wide from 4th Street to 5th Street, owing to old subway incline.
	Old Colony	Dorchester Street	N-S	Secondary Street	1-1	8,000	
	Dorchester Ave.	Columbia Road	N-S	Secondary Street	1-1	6,000	
Old Colony Avenue	Dorchester Ave.	Preble Street	N-S	Primary Street	2-2	12,000	
	Preble Street	Columbia Road	N-S	Primary Street	3-3	17,000	Southbound traffic underpasses Columbia Road.
Broadway	Dorchester Ave.	Dorchester Street	NW-SE	Primary Street	1-1	14,000	No center stripe. Much double parking.
	Dorchester St.	"L" Street	E-W	Primary Street	1-1	8,000	No center stripe. Heavy truck traffic.
	"L" Street	Day Boulevard	E-W	Secondary Street	1-1	5,000	No center stripe. No buses.
Day Boulevard	Old Colony Ave.	"L" Street	NE-SW	Primary Street	2-2	12,000	Columbia Road serves as frontage road on north side. Combined with "L" Street and Summer Street to form a through route.
	"L" Street	Castle Island	NE-SW	Secondary Street	1-1	4,000	Primarily a recreational drive or parkway.

(Continued)

Table 1 (Cont.)

Facility	From	To	Direction	Classification	No. of Moving Lanes*	Approximate 1962 Average Daily Traffic	Remarks
Dorchester Street	Dorchester Ave.	Old Colony Ave.	NE-SW	Primary Street	2-2	8,000	Has narrow median.
	Old Colony Ave.	Broadway	NE-SW	Primary Street	1-1	8,000	Part of major truck route to and from Southeast Expressway.
	Broadway	First Street	NE-SW	Collector Street	1-1	4,000	
"A" Street	Congress Street	Dorchester Ave.	N-S	Secondary Street	1-1	6,500	Trucks project into street from abutting buildings.
"E" Street	Summer Street	Old Colony Ave.	N-S	Secondary Street	1-1	8,100	Trucks project into street from abutting buildings.
Southampton Street	New Market	Dorchester Ave.	E-W	Primary Street	1-1	18,000	Major trucking route.
Preble Street	Dorchester Ave.	Old Colony Ave.	E-W	Secondary Street	1-1	6,000	
Boston Street	Massachusetts	Dorchester Ave.	NE-SW	Secondary Street	1-1	10,000	
Fourth Street	"L" Street	"Q" Street	E-W	Collector Street	1-1	--	Bus Route.
Eighth Street	Dorchester St.	"Q" Street	E-W	Collector Street	1-1	--	
First Street	Dorchester St.	Farragut Ave.	E-W	Collector Street	1-1	--	Major trucking route. Has railroad tracks in roadway.
"G" Street	Dorchester St.	Day Boulevard	N-S	Collector Street	1-1	--	Steep grade. Goes past high school.

*Number of effective lanes, by direction.

Southeast Expressway was built, volumes were considerably higher.

Broadway is the principal local arterial street located entirely within the GNRP area itself. The maximum volume on this street is 14,000 vehicles per day, just east of Dorchester Avenue. Although the width of this street is more than adequate for this volume, traffic flow is hampered by double parking particularly in the commercial area west of Dorchester Street. Buses are forced to load and unload in the traffic lanes because bus loading zones are occupied by parked cars.

Dorchester Street (not to be confused with Dorchester Avenue) connects the freight terminal area north of the GNRP with Massachusetts Avenue and the Southeast Expressway via Andrew Square and Southampton Street. Volumes on this street approximate 8,000 vehicles per day of which approximately 20 per cent are commercial vehicles. The large number of heavy trucks which use this street must negotiate a grade of approximately six per cent; this impedes the free flow of traffic and the resultant noise detracts from the value of abutting residential property.

First Street serves as a collector street for the industrial area north of the GNRP area, and provides access to the Castle Island Harbor Terminal for trucks. Two railroad tracks are located in the roadway of this street. The narrow width, rough pavement, and the presence of ~~trucks~~ railroad tracks make First Street unattractive to the average motorist.

Fourth Street and Eighth Street serve as collector streets and are used by bus lines serving the area. "G" Street serves the South Boston High School.

Traffic Problem Locations

The most severe problem in the GNRP area is the nuisance effect on residential property of truck traffic generated in the freight terminal, port and manufacturing area to the north. Trucks filter through the residential areas west of Dorchester Street and commercial vehicles constitute over 20 per cent of the traffic on Dorchester Street itself.

Several high-accident locations are in or near the GNRP area. Andrew Square, for example, was the scene of 30 reported accidents in 1960. Accident experience at selected intersections in South Boston is shown in Table 2.

Table 2

ACCIDENT EXPERIENCE
High Accident Locations, 1956-1960

Location	Number of Accidents					Five-Year Average
	1956	1957	1958	1959	1960	
Andrew Square	10	13	9	14	30	15
Columbia Road and Dorchester Avenue	11	15	23	20	17	17
D Street and Old Colony Avenue	21	17	10	6	12	13
D Street and West First Street	9	3	7	7	4	6
Dorchester Avenue and West Broadway	21	17	10	6	12	13
Dorchester Avenue and West Fourth	10	10	5	4	1	6
Dorchester Street and Old Colony Avenue	21	25	18	10	9	17
East Broadway and L Street	5	8	4	4	7	6

The opening of the Southeast Expressway, which occurred in 1959, has apparently led to a reduction in accidents at some locations (e.g. Dorchester Avenue and West Fourth Street) and an increase at others (Andrew Square) owing

to the change in traffic patterns.

Double parking and illegal parking, particularly in the commercial strip development along Broadway, delay and obstruct the flow of traffic. These conditions are a reflection of the lack of off-street parking serving this area. Lack of loading zones and off-street loading areas results in double parking by trucks while deliveries are being made.

Public Transit

South Boston is served by the Harvard-Ashmont rapid transit line of the MTA with stops at Broadway, Andrew Square, and Columbia Road. From the first two locations, the MTA operates feeder bus lines along Broadway, Dorchester Street, West Seventh and East Eighth Street. The Summer Street bus line links the easterly residential area of South Boston with the South Station area. Direct bus service to the corner of Broadway and Tremont Streets in Downtown Boston is available via the Broadway Bridge over Fort Point Channel.

It is estimated that approximately 12,000 people per day board rapid transit trains at the stations serving the area, and approximately 5,000 more enter or leave the area by bus. Before 1953, direct street car service from City Point to Downtown was available by way of Broadway and the Tremont Street Subway. Since then, passengers from South Boston have had to transfer either at Broadway Station or at the old Tremont Street Subway incline. Until 1961 a free transfer was possible at both points. Since then a reduced fare has been established for trips on surface lines, but the free transfer has been abolished. With the impending removal of the Broadway Bridge over the Turnpike Extension,

why when

access from South Boston to the Park Square office and commercial district promises to become even more circuitous and indirect.

Present and Projected Traffic Generation

There are approximately 15,000 dwelling units in the South Boston GNRP area which presently generate approximately 60,000 person trips. It is estimated that approximately 20,000 of these are auto driver trips. In addition, the employment activities in South Boston (generally north of the GNRP area), attract approximately 60,000 motor vehicle trips into the area. Since population and employment in this area appear to be stable, little or no increase in person trips is anticipated. On the other hand, due to increased automobile ownership and reduced transit usage, a 20 per cent increase in total vehicle trips is projected for this area. Owing to a diversion of through trips to routes peripheral to the GNRP area, only a slight net increase in total traffic into and out of the GNRP area is expected.

Circulation Plan

The circulation plan for the South Boston GNRP shown in Figure 1, removes through traffic, particularly commercial traffic, from residential areas. At the same time it provides improved or new routes on the periphery of the area to accommodate anticipated increases in traffic volumes. A high-capacity major external route is proposed parallel to the Southeast Expressway, which is severely overloaded during peak travel periods. Table 3 summarizes the proposed major street plan.

Table 3

PROPOSED MAJOR STREETS
South Boston GNRP
(Residential Collector Streets Excluded)

Facility	From	To	Classification	No. of* Lanes	Remarks
Southeast Expressway	Neponset River	Southampton Street	Expressway	4-4	Widened to eight lanes. Borders GNRP.
Morrissey Boulevard & Old Colony Avenue	Freeport Street	Dorchester Avenue	Primary Street	4-4	Grade separations at major cross streets and partial access control. Borders GNRP.
Dorchester-Atlantic Connector	Dorchester Avenue	Atlantic Avenue	Primary Street	4-4	Grade separations at major cross streets and partial access control. Extension of Morrissey Boulevard. Borders GNRP.
New Truck Route	Dorchester-Atlantic Connector	West First Street	Primary Street	2-2	Parallels railroad tracks. Grade separations and partial access control. Part of major truck bypass around GNRP area.
First Street	New Truck Route L Street	~~Castle Island~~ Castle Island	Primary Street Secondary Street	2-2 2-2	R. R. tracks should be relocated along north side of street. Part of major truck bypass around GNRP area.
Day Boulevard (Strandway)	Morrissey Blvd.	L Street	Secondary Street	2-2	Recreational parkway along south boundary of GNRP.
Day Boulevard (Strandway)	L Street	Castle Island	Secondary Street	1-1	Recreational parkway along southeast boundary of GNRP.
Broadway	Dorchester Ave.	Dorchester Street	Secondary Street	2-2	"Main street" of GNRP.
Broadway	Dorchester St.	Day Boulevard	Secondary Street	1-1	"Main street" of GNRP.
Dorchester Street	Dorchester Ave.	Broadway	Secondary Street	1-1	Trucks to be diverted.
Dorchester Avenue	Columbia Road	Southeast Expressway	Secondary Street	1-1	Borders GNRP.
Dorchester Avenue	Southeast Exp.	Dorchester-Atlantic Connector	Primary Street	2-2	Connects SE Expressway to Dorchester-Atlantic Connector.
Dorchester Avenue	Dorchester-Atlantic Connector	Summer Street	Secondary Street	1-1	Service road for Dorchester-Atlantic Connector. Borders GNRP area.
L Street	Day Boulevard	First Street	Secondary Street	1-1	Connects with Summer Street.
Summer Street	First Street	Dorchester Avenue	Primary Street	2-2	Located outside GNRP, serves port and freight terminal area.
Preble Street	Dorchester St.	Morrissey Boulevard	~~Secondary~~ Collector Street	1-1	Re-routed to simplify Andrew Square.
Columbia Road	Morrissey Blvd.	Day Boulevard	~~Secondary~~ Collector Street	1-1	Recreational parkway along south boundary of GNRP.
D Street	Summer Street	First Street	Secondary Street	1-1	Located outside GNRP, serves port and freight termi

*Number of effective lanes, by direction.

To accomplish the rerouting of heavy truck traffic around the periphery of the GNRP, a new facility is proposed east of "A" Street along the New Haven Railroad freight line tracks in conjunction with a major improvement of First Street. This route can be made attractive to truckers if it is designed with large-radius curves and if it provides a good connection with the expressway system. The new route would have more favorable grades than the present route via Dorchester Street.

The new road paralleling "A" Street should be a divided highway with some degree of access control. A partial interchange is proposed at Broadway because of the heavy crossing and turning movements anticipated at this intersection. Since it would become the second major truck route of the area, First Street east of "C" Street should be reconstructed with four moving lanes, heavy duty pavement, and a reservation on the north side for railroad tracks.

The feasibility of extending the truck highway north of First Street also should be carefully evaluated. The location shown in the GNRP plan passes through the New Haven Railroad's principal freight yard in the Boston area. A location on either side of the yard would have to consider the need for maintaining rail service to numerous terminals and siding tracks. Along the west edge of South Boston, including the GNRP area, a high-type arterial should be developed to serve present major north-south traffic in that area, and act as a relief route for the Southeast Expressway-Central Artery routing. This facility would consist of the Atlantic-Dorchester Avenue connector, and major improvements to Dorchester Avenue and Old Colony Avenue, leading directly into

Morrissey Boulevard. Since they interfere with smooth traffic flow, the traffic circles at Preble Street and Columbia Road should be removed, or redesigned, so that north-south traffic no longer would need to pass through them.

Dorchester Avenue, south of its junction with Old Colony Avenue, should be widened and improved through Andrew Square, to the point where it crosses over the Southeast Expressway. A pair of new ramps at this location should link directly to the expressway, thus encouraging locally generated traffic to leave the expressway and use the Dorchester Avenue arterial. Commercial traffic to and from the new roadway paralleling "A" Street would be expected to use this means of access to the Southeast Expressway.

The GNRP plan proposes closing a series of streets intersecting Old Colony Avenue, thereby (a) facilitating traffic flow on that artery and (b) forcing commercial vehicles to use the new route parallel to "A" Street. A high-capacity channelized intersection should be constructed where Dorchester and Old Colony Avenues divide. A grade separation will ultimately be necessary at this point to develop the full capacity of the Dorchester Avenue Arterial.

Major street relocations and reconstruction, including new grade separation structures, also will be necessary in the area where the proposed major north-south route intersects Broadway and West Fourth Street (Dover Street). This need will be accentuated if the proposed stadium and new market installations contemplated in the South Bay area are developed.

In general, the triangular area bounded by Fort Point Channel, First Street and the New Haven Railroad's freight line, will require considerable

additional study, primarily because major land use and circulation proposals lying outside the GNRP which will have a significant influence on this area, have not fully crystallized at this time.

In conjunction with the upgrading of Dorchester Avenue to major arterial status, the plan proposes a substantial redesign of Andrew Square. Boston Street would be routed into Dorchester Avenue and Preble Street into Dorchester Street, in order to reduce the number of approaches to the intersection. These planned realignments appear desirable because they will facilitate the installation of traffic signal controls, which will reduce accidents at this intersection.

Circulation within the GNRP area would be facilitated by the designation of additional collector streets. East Eighth Street and a portion of East Fourth Street which carry bus lines should be given this designation. "G" Street, which serves both the high school and the shopping district at Broadway and Dorchester Street, as well as "D" Street and West Seventh Street should also be included in this category. "I" Street and "O" Street also might be considered as collector streets.

A bill has been filed in the State Legislature and from time-to-time proposals have been made calling for the construction of a tunnel between South Boston in the vicinity of Fort Point Channel to East Boston. Extensive traffic projections, route studies and revenue studies would be necessary before the feasibility of such a tunnel could be established. Early completion of these studies would permit acquisition or reservation of right-of-way to be coordinated with renewal plans for the GNRP area.

Traffic Projection and Assignment

Through traffic east of the Dorchester Avenue-Old Colony Avenue route is expected to decrease 50 per cent, owing to improved quality of service on the Southeast Expressway and the Dorchester-Old Colony-Morrissey Boulevard routes which will divert traffic from L Street-Strandway Route. It is estimated that through traffic on these facilities will increase approximately 25 per cent from 117,000 to 150,000 vehicles per day. Traffic on the other major streets leading into and out of the area is expected to increase approximately 10 per cent between now and 1980.

Screenlines were established to facilitate the assignment of traffic to present and planned facilities. Table 4 compares present and projected traffic volumes with desirable route capacities.

The Southeast Expressway is expected to continue operating at capacity, assuming widening to eight lanes. Establishment of bus lanes, or revival of rail service on the Old Colony -- would change assignable traffic volumes and also affect the usage of the Morrissey Boulevard-Dorchester Avenue alternate routes. Expressway needs in this area should be restudied at a later date in the light of findings of the Boston Regional Planning Project study and of the Mass Transportation Commission demonstration projects. In the present study, primary attention was directed to major streets within the GNRP and to developing new truck routes.

Table 4

PROJECTED TRAFFIC VOLUMES
Selected Major Streets, South Boston GNRP

Facility	1962 AADT(1)	1980 AADT(1)	Design Capacity
Screenline North of Broadway			
Central Artery	100,000	90,000	90,000
Dorchester Avenue	10,000	50,000	50,000
"A" Street	6,000	--	Local
New Truck Route	--	20,000	25,000
"D" Street	8,000	3,000	5,000
Dorchester Street	8,000	6,000	10,000
"G" Street	--	3,000	5,000
"L" Street	10,000	6,000	10,000
Farragut Road	--	--	5,000
Day Boulevard	--	--	Recreational
TOTAL	142,000	178,000	200,000
Screenline East of Old Colony Avenue - Dorchester Avenue Extended			
Northern Avenue	13,000	15,000	15,000
Congress Street	5,000	5,000	8,000
Summer Street	20,000	25,000	25,000
Broadway	14,000	10,000	15,000
West Fourth Street	6,000	16,000	20,000
New Truck Route	--	10,000	15,000
Dorchester Street	8,000	6,000	10,000
Columbia Road	8,000	5,000	8,000
Day Boulevard	15,000	20,000	20,000
TOTAL	89,000	112,000	136,000
Screenline South of Southampton Street, Preble Street and Columbia Road			
Southeast Expressway	100,000	100,000	120,000*
Boston Street	10,000	(Combined with Dorchester)	--
Dorchester Avenue	7,000	6,000	10,000
Morrissey Boulevard	17,000	50,000	50,000
Day Boulevard	15,000	20,000	20,000
TOTAL	149,000	176,000	200,000

(Continued)

Table 4 (Cont.)

Facility	1962 AADT(1)	1980 AADT(1)	Design Capacity
Screenline West of "L" Street			
Summer Street	15,000	10,000	20,000
East First Street	8,000 (est.)	5,000	10,000
East Broadway	8,000	10,000	10,000
East Eighth	--	3,000	5,000
Day Boulevard	12,500	15,000	20,000
TOTAL	43,500	43,000	65,000

*Assumes widening to eight moving lanes.

(1) AADT - Annual Average Daily Traffic

East-west streets in South Boston closest to downtown Boston, where they have a radial character, are expected to operate at capacity. Farther south, where they also carry circumferential traffic, they would be less fully utilized.

Wilbur Smith and Associates

TRAFFIC • PARKING • TRANSPORTATION ENGINEERS

April 12, 1965

Mr. James B. Drought
Assistant Administrator for Development
Boston Redevelopment Authority
City Hall Annex
Boston 8, Massachusetts

Dear Mr. Drought:

We are pleased to submit the accompanying draft report [illegible] the proposed arterial highway plan for the Regional Core Area. This report represents a part of a larger report which in addition reviews the existing system and the objectives of the plan.

The proposals advanced by the BRA planners during the joint work on the Regional Core Circulation Plan have been thoroughly reviewed and evaluated.

The Regional Core Area covered by this report includes the Downtown, South End and Back Bay GNRP areas in their entirety. It also includes a substantial part of the Parker Hill-Fenway Area. Earlier reports have covered the Roxbury-North Dorchester, East Boston, South Boston, and Jamaica Plain GNRP areas.

The final report will include a map showing the arterial highway plan for the study area as a whole.

There is a slight change in terminology in this report in contrast to earlier reports. We are revising our customary street classification terms to conform to the definitions promulgated by the AASHO and the National Committee on Urban Transportation. The terms used in this report are defined in Appendix A. Subsequent reports and final editions of draft reports will use the new terminology.

We trust that this material will prove helpful to you in the development of detailed project plans in this area.

Very truly yours,

WILBUR SMITH AND ASSOCIATES

Paul E. Conrad

Paul E. Conrad

PEC/md

ELEMENTS OF THE MAJOR STREET PLAN
Boston Regional Core Area(1)

A tentative plan of major streets and highways has been developed for the Regional Core Area. It is based generally upon consultations between GNRP planners and the special Metropolitan planning team. These proposals were carefully evaluated as to their adequacy in serving anticipated traffic needs and, as a result, many changes and additions have been made.

The plan includes expressways, (both "freeways" and "expressways-at-grade"), major arterials, and the more important collector streets. A more detailed discussion of the street classification system used, may be found in Appendix A. The recommended plan is shown in Figure 1. Table 1 lists the most important routes of the proposed plan, giving information on design features, projected traffic volumes, degree of access control and other data.

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(1) This represents only a portion of the work on Major Streets and Transportation for the Regional Core Area. In the complete report, prior sections will deal with the present street and highway system, traffic volumes, public transportation, and parking. Planning objectives, present and future traffic generation, and the resultant effects on street, public transit and off-street parking needs, will also be covered.

MAJOR STREET PLAN
REGIONAL CORE AREA
BOSTON, MASSACHUSETTS

FIGURE 1

FREEWAYS OR EXPRESSWAYS

A series of expressways will [illegible] system of Boston's Regional Core [illegible] east Expressway, Central Artery, [illegible] Tunnels-East Boston Expressway) will be supplemented by [illegible] expressways from the north, northwest, west, and south, all of which will be linked by the inner circumferential or Inner Belt Expressway. [illegible] Turnpike Extension, now under construction, which forms the [illegible] way, will pass through the Regional Core Area.

Inner Belt Expressway

The Inner Belt Expressway will completely encircle the Regional Core Area of Boston and, in addition, will enclose part of Cambridge and Somerville. It is designed to connect expressways which radiate from Downtown Boston with each other, and to bypass the heavy through traffic volumes which would otherwise be forced onto downtown streets or other Regional Core Area streets.

This route will facilitate accomplishment of urban renewal plans by attracting through trips, some of which now use local residential streets, and by providing a relief route for presently overtaxed sections of Massachusetts Avenue and the Central Artery. This route will be of particular benefit to truck

operators, who are now forced [illegible] for lack of a satisfactory crosstown route for commercial vehicles.

Location - The location for the proposed Inner Belt Expressway, recommended by the consulting engineers of the Massachusetts Department of Public Works,[1] begins at the existing dolphin-interchange of the Connecticut Turnpike and Southeast Expressway. From there it runs through northern [illegible] interchange with the Southwest Expressway in the vicinity of Ruggles Street and Westminster Street, and generally follows the alignment of Ruggles Street passing under the four-track mainline of the New Haven Railroad. [illegible] of the railroad, the Inner Belt continues to follow Ruggles Street as far as Huntington Avenue. A pair of one-way tunnels are proposed to pass north and south of the Museum School of Art northwest of Huntington Avenue. The route would then take part of the Back Bay Fens Park, go under the Boylston Street intersection, and then up (on a [illegible] per cent grade), over the Riverside Line of the MTA, onto a two-level elevated structure. It would pass through a portion of Brookline and Brighton on structure and continue across the Charles River to Cambridge.

Scheduling - Present plans of the Department of Public Works call for relatively late completion of the Inner Belt Expressway, which is a part of the Interstate Highway System. Because of the evident need for an additional major

(1) Hayden, Harding and Buchanan, Inner Belt and Expressway System. Massachusetts Department of Public Works, Boston, Massachusetts, 1962.

crosstown arterial highway, it is [illegible] by [illegible] the City of Boston investigate the possibility of an earlier [illegible] of this [illegible]. It would be possible to coordinate this project with plans for urban renewal in the South End, Roxbury-North Dorchester, and Parker Hill-Fenway.

If at all possible, construction of the [illegible] Inner Belt should be commenced by the City of Boston without delay. It is desirable to provide for crosstown traffic presently using the Inner Belt corridor. Even if trucks were to be excluded from these roadways, [illegible] provide substantial relief for passenger car traffic now using Massachusetts Avenue and the other overtaxed crosstown routes. It is particularly desirable that the Inner Belt Expressway be completed before any more major radials, other than those presently under construction, are brought into the Regional Core region.

Proposed Changes - The route selected has been thoroughly studied by the Department of Public Works' consulting engineers, and the proposed Inner Belt system is well-integrated into the present major street system. However, urban renewal plans developed by the Boston Redevelopment Authority will probably require some changes in the location and design of certain ramps. [illegible] to relocate the large interchange of the [illegible] in Roxbury.

The Inner Area Planning Staff of the BRA has made the following proposals with respect to the Inner Belt:

(1) Relocate the Interchange of the Inner Belt and the Southwest Expressway westward from the vicinity of Huntington Avenue to the vicinity of Columbus Avenue and Ruggles Street.

(2) Relocate Columbus Avenue eastward around the interchange so that it passes east of the Williams School Housing Project.

(3) Continue Parker Street directly across the Inner Belt.

(4) Construct both tunnel roadways sections south of the Museum School of Art, between the School and Ruggles Street.

(5) Keep the Inner Belt roadway approximately 20 feet below ground level through the Fens from the tunnel portal to the Brookline Avenue overcrossing, instead of a less sharply depressed alignment between these points.

(6) Construct the southbound lanes of the Inner Belt on the right-of-way presently occupied by The Fenway.

(7) Combine the northbound and southbound service roads into a single two-way road between Parker Street and Brookline Avenue. This service road would be located at present street levels on a structure above the southbound expressway lanes.

(8) Change the ramp system leading the expressway in the Fens area, as indicated in Figure 2. One pair of ramps to and from the north would be omitted.

(9) Encourage limited air [illegible] expansion above the [illegible].

Design Considerations. - [illegible] changes in design, major [illegible] considerations. More detailed [illegible] will be required in many instances [illegible].

The principal requirements [illegible] are as follows:

(1) Adequate standards of geometric [illegible] throughout, both on the expressway and on similar roadways. Thus, for example, the new location of Columbus Avenue must provide six adequate moving lanes, a parking lane or shoulder, and left turn lanes at intersections. The [illegible] radius should be 500 feet.

(2) Sufficient space must be provided for the four railroad tracks of the New Haven Railroad in this area, as all four tracks may [illegible] be required for local and express railroad and rapid transit service.

(3) Provision must be made for the continuity of service roads as along the inner belt expressway or for their connection to multi-lane major streets of adequate capacity and geometric design.

(4) Provision must be made to maintain traffic [illegible] arterial streets during the construction period.

(5) Continuity must be provided on all major streets leading to the Inner Belt (both Arterials and Collectors).

(6) Projected volumes, as indicated in the D.P.W. consulting engineers' report and as adjusted by Wilbur Smith and Associates staff on the basis of previous studies, must be adequately provided for.

(7) Taking of (or substantial damage to) public housing projects, civic institutions, or historic structures must be avoided.

(8) The design of interchanges and ramps must be coordinated with the development of adjacent land.

(9) Underground utilities, particularly the Dorchester Brook conduit, must be considered in the revised plan.

Advantages of BRA Southeast Expressway - The revisions proposed by the BRA Regional Core Area planners are intended to facilitate land development objectives in the South End, Roxbury-North Dorchester, and Parker Hill-Fenway CNRP areas.

Particular advantages are as follows:

(1) The shift in the location of the interchange would provide a better pedestrian and local traffic link from the Dudley Station area of Roxbury to nearby residential areas in the South End and to the Whittier Street Housing Project in Roxbury.

(2) The relocation of the interchange also would place it on the

boundary of the GNRP, a desirable location from a [illegible] planning point of view.

(3) The land in the Madison [illegible] available for industrial or other highly productive [illegible] occupied by the [illegible]

(4) Continuing Parker Street across the Inner Belt would allow it to be developed as a major street connecting the [illegible]-North-eastern Area with the ramps of the Southwest Expressway south of Jackson Square.

(5) Continuity in Parker Street also is highly desirable for local circulation within the Parker Hill-Fenway GNRP area.

(6) The proposed changes in the Fens area would reduce the adverse effects on adjacent institutional and residential developments from expressway traffic and would allow the continuity of the Fens Park to be maintained.

(7) The proposed grade revisions [illegible] also permit a better pedestrian and visual connection between the [illegible] and the apartments on the opposite side of the Muddy River.

(8) With the service roads combined and located on the west side of the Inner Belt, the residential property along Park Drive will be shielded from the adverse effects of traffic on the expressway and service road.

Disadvantages of the BRA Staff Proposals - In general, the proposals of the BRA Regional Core Area planning staff would substantially increase the cost of construction of the Inner Belt. The following disadvantages are apparent in the changes in the Inner Belt Expressway [illegible] by the BRA Staff:

(1) As two levels of ramps would have to be provided [illegible] the New Haven Railroad tracks, the amount of excavation for the Southwest Expressway -- Inner Belt interchange would be considerably increased.

(2) The relocation of Columbus Avenue, together with its underground utilities will add substantially to construction costs.

(3) Because the expressway would be below grade all the way from Madison Park to Brookline Avenue, the relocating of the Stony Brook drainage conduit would be more difficult.

(4) Several relatively substantial, non-residential buildings would have to be taken in the vicinity of Columbus Avenue and Ruggles Street.

(5) A heavily traveled at-grade arterial (Columbus Avenue) would be interposed between the Whittier Street Housing Project and the rest of the Roxbury CNRP area.

(6) A portion of the land of the Mission Hill Extension Housing Project would be taken.

(7) Retaining walls would be necessary at several points to avoid taking Housing Project buildings and to provide minimum

clearances between [illegible] and [illegible] roads.

(8) The service road structure [illegible] about [illegible] lanes in the Fens Area would add considerably [illegible] to the structure.

(9) Ventilation of the southbound [illegible] would be inferior to that in open cut. Maintenance would be [illegible].

(10) The reduction in ramps to and from the north on the Inner Belt will result in overloading [illegible] connecting ramps and the service road north of [illegible] Avenue.

(11) The "rotary" intersection at the Brookline Avenue service road intersection would be [illegible].

(12) Excessive grades would be introduced on the Inner Belt north of Brookline Avenue.

(13) Trucks carrying inflammable or toxic chemicals, which would be prohibited from using the tunnel, would have to utilize the service road at grade all the way from Brookline Avenue past the institutions to the Southwest Expressway Interchange.

(14) Overall, it is estimated that the proposed changes in the Fens area will increase the cost of construction of the Inner Belt approximately $5,000,000. The proposed change in location of the interchange will increase its cost by

approximately [illegible] depending on the design [illegible] (see [illegible]).

(15) The area proposed for light industrial development has little or no potential for rail access. The [illegible] of the Whittier Street Housing Project had [illegible] bility of rail access [illegible] industrial purposes for that area.

Recommendations - It appears that the long-range values of the land use advantages will justify the proposed changes in the design of the Inner Belt in the Fens area. If an acceptable means can be found of eliminating them, they should be incorporated into the design of the Inner Belt with the following modifications, as shown in Figure [illegible].

(1) The interchange between the proposed Boylston-Riverway Arterial (which is treated more fully elsewhere) and the service roads at Brookline Avenue must be redesigned to permit reasonable grades on the Inner Belt and to operate more satisfactorily.

(2) Two successive on ramps and off ramps connecting the service roads with the Expressway to and from the north must be provided, as originally recommended by the B.R.W. consultants.

(3) The southern pair of ramps [illegible] as close [illegible] to the tunnel portal, [illegible] to minimize [illegible] the service road [illegible] on the [illegible]. (2)

(4) The transition from two-way to one-way operation on the service road should be [illegible] the tunnel portal near the Museum of Fine Arts. This will allow a gradual transition curve and provide maximum flexibility in channelizing the intersection of Huntington Avenue with the service roads.

(5) The two-way portion of the service roads should provide two adequate moving lanes in each direction, plus a breakdown lane or shoulder. At the intersection of Avenue Louis Pasteur and the service roads, a left turn storage lane will be required.

The change in location of the interchange appears less clearly warranted on the basis of land use benefits, than those in the Fens area. If residential rather than industrial re-use were planned for the area occupied by the interchange as recommended by the Department of Public Works' consultants, then the proposed would be clearly justified.

(2) This adjustment can and should be made even if the one-way service road system must be retained.

Massachusetts Turnpike Extension -

The Massachusetts Turnpike [illegible] terminus in Weston to a connection [illegible] of South Station. This highway [illegible] ble on any part of the turnpike. [illegible] extent for the Inner Belt between Brighton and the Central Artery, [illegible] function will be in serving trips between downtown and points west.

Location - The turnpike structure [illegible] Boston and Albany (New York Central) Railroad [illegible]. The railroad is being reduced from four tracks to two, [illegible] is being taken to provide the [illegible] of the right-of-way. [illegible] the railroad is being relocated [illegible] on the south side of the right-of-way for [illegible] Parker Hill-Fenway GNRP area. [illegible] Back Bay Station) property has been [illegible] of the right-of-way.

Interchanges - Tolls will be collected at two barriers, one at [illegible] and one in Brighton. Between the Brighton interchange, just outside of the Regional Core Area, and Dorchester Boston there will be no on-ramps eastbound, nor any off-ramps westbound. In the Regional Core Area there will be one interchange at Copley Square and one at the Central Artery, together with two additional westbound on-ramps.

The interchange with the [illegible] of the tunnel entrance at [illegible]. [illegible] Central Artery is presently [illegible] point.

The number and location of [illegible] off-[illegible] presence of the railroad tracks [illegible] from Brighton to the Central Artery. There is [illegible] in the Copley Square area, where a [illegible] is introduced [illegible] road. It is estimated that approximately one [illegible] of the total [illegible] on the Turnpike entering the study area will use this interchange. [illegible] daily vehicle trips destined to points in the [illegible] Center, Park Square, Back Bay, and South Cove areas in 1980. [illegible] traffic entering from the same [illegible] at Arlington Street, Trinity Place, [illegible] Street.

As projected Turnpike usage approaches design capacity, [illegible] congestion will result on Dartmouth Street in Copley Square, on other [illegible]-face streets in that area, and in particular on Huntington Avenue.

Service Road Improvements - To distribute turnpike traffic [illegible] number of primary and secondary [illegible] between Copley Square [illegible] Central Artery, it is proposed to develop a parallel service road system [illegible]-necting the off-ramp at Dartmouth Street with the [illegible] bridge over Fort Point Channel. Buckingham Street, and Herald Street (both widened, where necessary), would be incorporated into the [illegible]bound distribution road, while [illegible]

would be located immediately [illegible]

On the north side of the [illegible] is building a service road between [illegible] on-ramp will be located just west of [illegible] road will act as a collector for this ramp. It [illegible] facility westerly to Clarendon [illegible] this way, traffic destined for the Turnpike [illegible] reach the collector at any point, and [illegible] ramp.

The service roads should be designed with [illegible] to 50 feet, to provide three or [illegible] a lane for stopped vehicles and for right turns. The [illegible] cross-section is approximately 25,000 vehicles per day [illegible] cross traffic. Channelized turning lanes will be [illegible] sections in addition to the through lanes to [illegible] projected volumes. This capacity will be necessary to accommodate [illegible] to and from the South [illegible] Connector when that facility is built.

In evaluating the advantages and disadvantages of the service road proposal consideration was also given to the [illegible] of avoiding [illegible] phase traffic signals.

Advantages - In addition to serving the Turnpike Extension as a collector-distributor the continuous service roads would also provide a number of other benefits, including the following:

(1) Create additional surface street capacity between the Prudential Center and the Central Artery and the South Station area, thus supplementing Huntington and Dartmouth Streets.

(2) Provide collector-distributor [illegible] for the Southwest Expressway Extension which [illegible] terminate in the Copley Square area.

(3) Serve [illegible] important cross-town traffic movements in connection with Charles, Arlington, Berkeley, and Clarendon Streets; this traffic is presently partly carried on Broadway, which will be severed by the Turnpike and is to be eliminated west of Massachusetts Avenue.

(4) Create a relief route for the Turnpike which would be valuable in case of flooding, serious breakdowns or other emergencies.

(5) The South End Urban Renewal Project, now in an advanced stage of planning, offers an excellent opportunity to secure rights-of-way for part of the eastbound roadway.

(6) The development of service roads will permit removal of the section of Huntington Avenue which cuts through Copley Square. This is a desirable change from a land development viewpoint.

Disadvantages - The principal problem resulting from the construction of service roads along the Turnpike would be the creation of multi-legged intersections where the service road alignment intersects the overall street grid.

In order to avoid such complicated intersections the following changes in present streets would be required:

(1) Chandler Street should be closed between Berkeley and Arlington Streets.

(2) Columbus Avenue will have to be closed or made one-way between Arlington and Dartmouth Streets.

(3) The Clarendon Street bridge will have to be either [illegible], modified and channelized, whichever is alternative is [illegible].

(4) Signals at the intersection of Arlington Street, Tremont Street and the northern (westbound) service road will require more than two phases.

(5) When the Southwest Connector is built some expensive construction will be required to bring traffic into the service roads with a minimum of conflict and delay.

Recommendations - In general, the advantages of service roads along the Turnpike outweigh the disadvantages. The following specific recommendations are made:

(1) The service road [illegible] along the Massachusetts Turnpike.

(2) The eastbound service road [illegible] the westbound service road, [illegible] eastbound off-ramps.

(3) The necessary [illegible] by the time the Southwest Expressway [illegible] to improve the operating [illegible] roads.

Central Artery (John F. Fitzgerald Expressway)

The Central Artery is the oldest facility of the Boston type in the Regional Core Area. The first section from Charlestown to High Street was completed in 1954 and the remaining section in 1959.

Location - The Central Artery runs on viaduct from a point near the Mystic River Bridge in Charlestown through the North End and the Market District in Downtown Boston. Near the intersection of Kneeland Street and Atlantic Avenue, it enters a tunnel section that goes between Chinatown and the Leather district. It emerges from the tunnel just south of Kneeland Street and parallels Albany Street from the tunnel to its interchange with the Southeast Expressway.

Existing Design - Six expressway lanes are provided, both on the structure and in the tunnel. South of Kneeland Street, a fourth lane or breakdown lane is provided as well. In addition to the expressway lanes, a service road (hereafter called the Surface Artery) is provided - with a few discontinuities - the entire length of the artery. There is a six-lane two-way divided street under the elevated section of the expressway from the entrance of the Sumner-Callahan Tunnel to High Street, where the expressway begins its transition from elevated structure to tunnel section. From High Street to Sumner Street the service road function is performed by Purchase Street and Atlantic Avenue, operating as a one way couplet. From Sumner Street to Kneeland Street there is a six-lane two-way divided street on top of the tunnel section of the express-

way. South of Kneeland Street a part of [illegible] serves [illegible].

Operating Problems - The existing [illegible] capacity during peak periods, with stop-and-go [illegible] from 7.5 to 20 miles per hour. The following [illegible] aggravate congestion on the Artery.

1. Frequent on and off ramps cause weaving movements on the expressway, and encourage its use by short trips.

2. Shoulders are not provided north of Kneeland Street. There is thus no room to park disabled vehicles.

3. Heavy trucks are slowed down by the grades [illegible] the tunnel section, reducing the speed which can be maintained by the traffic.

4. Acceleration lanes on the elevated section are inadequate. Entering traffic cannot merge smoothly into expressway flow.

Proposed Changes - A number of changes are proposed to improve the operating characteristics of the Central Artery. It is recognized, however, that the entire available capacity of this facility will be required in any event.

The following specific suggestions are made:

1. The Fort Hill Square ramp should be rebuilt so that it leads to South Boston and the proposed Dorchester-Atlantic Connector (see below).

2. The southbound on-ramp from Purchase Street should be rebuilt into a southbound off-ramp onto Purchase Street. This ramp will then be a convenient exit point for trucks carrying inflammable or dangerous chemicals which are prohibited from using the tunnel.

3. The northbound on-ramp from [illegible] Street should be closed, at least during peak traffic periods.

4. The northbound off-ramp at Northern Avenue should be [illegible] to feed only into Atlantic Avenue (instead of curving back under the [illegible]) to connect with the High Street intersection.

5. Extensive intersection improvements should be made at the intersections of the Surface Artery with High Street, Congress Street, [illegible] Street (Dewey Square), Essex Street, and Kneeland Street in order to avoid conflicts and expedite traffic movements on the Surface Artery.

6. Traffic controls on the Surface Artery should be improved to increase capacity and possible average speed.

7. The improvements on the Surface Artery proposed in the Boston North GNRP Circulation plan should be carried out. These include an overpass over the tunnel plaza and a one-way couplet utilizing the underartery road southbound and Washington Street North northbound.

Advantages - The proposed improvements in the Surface Artery will allow it to function as originally intended in the Whitten Plan[3] and in the Master Highway Plan of 1948.[4] Particular advantages are as follows:

(3) City Planning Board, Report on a Thoroughfare Plan for Boston, Boston Massachusetts, 1930.

(4) Massachusetts Department of Public Works, Master Highway Plan for the Boston Metropolitan Area, Boston, Massachusetts, 1948

1. It will act as a collector-distributor [illegible], permitting a reduction in the number of ramps.

2. It will provide an attractive [illegible] route for [illegible] trips in the downtown area.

3. It will provide a [illegible] for the expressway, [illegible] thus increasing the possible capacity of the proposed Central Artery [illegible] way and surface road by approximately [illegible] percent.

4. Improvements in the expressway, such as ramp closings, [illegible] will be permitted.

Disadvantages - The improvement of the surface artery conflicts with land use proposals in the Waterfront area. The Boston Waterfront Redevelopment plans envisions relocating the surface artery along India Street and Commercial Street through this area, resulting in major changes in [illegible] alignment and increased marginal frictions.

Specific problems involved are as follows:

1. The surface artery would remain as an obstacle to pedestrian movement between Downtown Boston and the Waterfront.

2. Increased illumination, continuously operated, would be necessary to eliminate driver resistance to using the Underground Artery and reduce its accident potential.

3. Some inconvenience would result from the removal of curb parking from the surface artery.

4. Some land taking would be required in the [illegible] for intersection improvement and channelization.

Recommendations - [illegible] the Central Artery, both the proposed [illegible] improvements appear warranted.

Early priority should be given to the following:

1. Rebuilding the [illegible] the expressway.

2. Improving the intersection in the [illegible] and Summer Street (Dewey Square), [illegible].

3. Installing special [illegible] section.

4. Construction of the [illegible] North GNRP Area.

It is essential that the [illegible] Surface Artery between High Street and the Tunnel [illegible]

Southeast Expressway

The Southeast Expressway in the [illegible] is presently operating at its possible capacity. Traffic in the corridor served by the Southeast Expressway is expected to increase at least 50 per cent between now and 1990. Since much of this growth will be potential to the expressway, it appears that it will be necessary to reconstruct the Southeast Expressway and its right of way

facility, especially south of Dorchester Avenue. A series of continuous on-ramps, and southbound on-ramps would perhaps [illegible] lane to the six-lane sections. [illegible] Morrissey Boulevard during peak periods, while trucks and buses would be encouraged to use improved Dorchester Avenue.

It would be possible to develop this [illegible] present roadway. However, it would then be necessary to provide [illegible] gravel shoulder strip for disabled vehicles. It is recommended that paved shoulders be avoided because of the tendency of local drivers to [illegible] shoulder where the road is at or over capacity. Although this practice increases the capacity of the highway where the shoulder is continuous, it is confusing and dangerous to other motorists.

Additional capacity in this corridor can be developed through rapid transit improvements incorporating the Old Colony Railroad right-of-way.

EXPRESSWAYS (FREEWAYS)

A number of the planned freeways are likely to be fully [illegible] soon after they are placed in operation. The best answer to this [illegible] problem appears to be the development of expressways at grade or [illegible] arterial streets more or less paralleling or [illegible] extensions to the major freeways in the Regional Core area and providing motorists with adequate alternate routes for shorter trips and for trips originating or terminating in intermediate areas. These routes would have at least partial access control, grade separations or high-type characteristics at major intersections.

Morrissey Boulevard, to some extent presently performs this type of function in the southeast corridor, although its connections to Downtown Boston are poor. The North Terminal Study[1] has shown [illegible] such facilities be provided to the north of Downtown Boston to relieve the Northeast, North and Northwest Expressways. Additional routes of this nature should be provided in the Regional Core plan to supplement and be integrated with expressways entering the area from the southeast, southwest, and west.

Storrow Drive

Storrow Drive, a parkway, restricted to passenger vehicles, presently serves as the most important single route entering Downtown Boston from the

(1) Barton-Aschman Associates, Inc., and others, North Terminal Area Study, August, 1962.

west. Its direct extension to the east is Soldiers Field [illegible] traffic from Brighton, Watertown and Cambridge.

In the Kenmore area, Storrow Drive is fed a large [illegible] of additional traffic from the Charlesgate [illegible] which in turn [illegible] by the Fens Park road system, Commonwealth Avenue, Beacon Street and Boylston Avenue. The Charlesgate connection [illegible] Worcester Turnpike (Route 9) and Jamaicaway (Route 1) [illegible] for Downtown Boston.

The Drive is a six-lane divided [illegible] between Arlington Street and Charlesgate, and a four-lane roadway [illegible] Arlington Street, the eastbound roadway [illegible] direct access from private property and local streets.

The intersections and access points are fully grade separated. However, the design standards in many instances are well below freeway standards.

The major operating and safety difficulties relate to access and [illegible] points. The Charlesgate connection, involving [illegible] grade crossing of access and Commonwealth Avenue, is by far the most troublesome spot; in that area [illegible] on Storrow Drive and surface streets [illegible] become congested beyond tolerable levels. In particular, peak inbound traffic [illegible] the through lanes is interfered with by back-ups of [illegible] traffic at Charlesgate.

Similarly, peak inbound traffic [illegible] at Dartmouth, Clarendon, and Arlington Streets has a tendency to interfere with through traffic on Storrow Drive.

Plans are presently [illegible] to build a [illegible] .

Charlesgate between Storrow Drive [illegible] Street [illegible] .

Construction of this overcrossing [illegible] the [illegible] of

Storrow Drive by eliminating the [illegible] through [illegible]

Beacon Street and Commonwealth [illegible] including the [illegible]-

ized weaving section at the Charlesgate [illegible]. It will [illegible] the [illegible]

of Beacon Street and Commonwealth [illegible] Storrow [illegible] would [illegible] on

these streets a greater portion of the [illegible].

Should extensive development of high-rise apartments [illegible] along

Beacon Street or along the Public Garden, replacing the [illegible] resi-

dential structures, opportunities to improve the connection between Storrow

Drive and Arlington, Berkeley and Dartmouth Streets, [illegible] available.

The intersection of Embankment Road and Boylston Street, [illegible], needs

to be reconstructed to provide a direct connection between [illegible] on-ramp and

Arlington Street. The Berkeley Street on-ramp also [illegible] to be modified to

provide three effective lanes entering [illegible] Street.

In conjunction with the Charlestown-Storrow Drive link proposed in

the North Terminal Study, the capacity of Storrow Drive should be increased

between Charles River Dam and [illegible] Street, to accommodate the additional

traffic loads imposed on it by [illegible] .

Some of the traffic [illegible] Storrow Drive [illegible] when the

Massachusetts Turnpike Extension is completed. Additional traffic from the

Route 9 and Route 1 corridors, [illegible] nature, however, is likely to [illegible] capacity of the highway.

Southwest Expressway Extension

The Southwest Expressway [illegible] close to the tracks of the New Haven [illegible] Belt Expressway in northern Roxbury. [illegible] been discussed earlier in connection with the [illegible] Belt Expressway.

The design for the interchange, [illegible] of Public Works' consultants, provides a pair of ramps between the Southwest Expressway and Tremont Street northbound and [illegible] This is desirable if a Columbus-Tremont one-way couplet is developed by the city. Such a one-way couplet would improve the traffic operating characteristics of these streets, [illegible] experience. However, the one-way scheme could be [illegible] land use planning viewpoint because it isolates a belt of residential land [illegible] not be treated as a separate neighborhood and it reduces the amount of frontage exposed to the nuisance of heavy traffic.

To overcome these disadvantages, a [illegible] type arterial street has been proposed along the New Haven Railroad tracks from the Southwest Expressway interchange to a connection with the Massachusetts Turnpike service road system in the vicinity of Clarendon street. This facility would have access control and would be grade separated [illegible] West Newton Street. All

minor streets would [illegible]

This route, called the [illegible] access from the Southwest [illegible] and would divert traffic from [illegible] traveled radial streets in the [illegible] permit Tremont Street and [illegible] and would afford better operating [illegible] street where the land service [illegible]

A location along the [illegible] the existing street pattern and [illegible] and through motor vehicle traffic [illegible] in a single corridor, minimizing the nuisance [illegible] coincides with the line [illegible]

Alternatives to the [illegible] the Tremont-Columbus one-way [illegible] tion of Columbus Avenue. [illegible] planned land uses in the South End. [illegible] of Columbus Avenue [illegible] high-type facility would be preferable [illegible] isolate a strip of land between Columbus [illegible] tracks. It also would be necessary [illegible] Columbus Avenue and to construct an underpass [illegible]

While the Tremont-Columbus [illegible] proposal to carry, it would [illegible] use and through traffic prevailing [illegible].

Two routes were studied [illegible] roadways on the South End side [illegible] Back Bay side and the northbound [illegible] scheme is preferrable from [illegible] though it would require a long and costly viaduct for the [illegible] each end of the extension. It is [illegible] approximately four million dollars [illegible].

With both roadways of the South [illegible] of the railroad tracks, the viaduct [illegible] eliminated and the connection [illegible] the Southwest Extension can utilize [illegible] minor changes. Considerably more [illegible] all of it in the South End Renewal Project area. The [illegible] from the tracks near Holyoke or [illegible] Columbus Avenue and Chandler Street at Dartmouth. It also would [illegible] discourage free pedestrian circulation between the Appleton Street section of the South End and the Copley Square area. [illegible] the Southwest Extension is considered less [illegible] point of view than the location [illegible] the Back Bay [illegible]. In addition

a pair of reverse curves at [illegible] Avenue would [illegible] introduce a southbound on-ramp at [illegible] the northern end of the Extension [illegible] preferred alignment.

Riverway-Boylston Connector

The proposed Charlesgate [illegible] Hospital [illegible] connection with its effect on Brookline Drive [illegible] the MDC has developed plans [illegible] Park Drive and the Fenway [illegible] the Fens. The MDC design appears to have [illegible] and could readily be tied in [illegible] Drive coupled with Boylston Street.

With the construction [illegible] development plans of the Boston [illegible] Fenway area, it will be necessary [illegible] (or expressway) from Route [illegible] Bay area. The [illegible] Riverway from the vicinity of Brookline Avenue [illegible] then connect directly to Boylston Street by means of an overpass.

Boylston Street would be widened [illegible] on one side so that partial access control could be [illegible] service road would be provided on one side to serve commercial development. On the other

side, a landscaped buffer [illegible] dential property. Six [illegible]

Adequate capacity [illegible] could be provided by [illegible] one-way couplet south of the [illegible] Street couplet, further to the [illegible] schemes would be less [illegible] speed and accident experience [illegible] improved Riverway-Boylston [illegible]

The construction of the [illegible] probably be carried out [illegible] ordinated with the construction of the [illegible] ment of the area between [illegible] an unbalanced-flow scheme [illegible] in peak hours) and three lanes [illegible] best combination of service to [illegible] and [illegible] of land values.

Atlantic-Dorchester Connector

In order to relieve the [illegible] volumes now contributed by the [illegible] develop a high-type surface route [illegible] and Morrissey Boulevard on the [illegible] Street on the north. This facility would [illegible]

Colony Avenue from Freble Street [illegible]

following Dorchester Avenue [illegible]

Southeast Expressway), [illegible]

Fourth Street and Broadway Bridge [illegible]

Broadway bridge to Northern [illegible]

go across filled land now occupied by [illegible]

lantic Avenue in the vicinity of [illegible] would become a high-

quality major arterial through the [illegible]

would connect with the North Terminal [illegible].

The proposed connector [illegible]

have a design capacity of [illegible] to [illegible] vehicles per day. Grade separations would be highly desirable [illegible] Avenue, Summer Street and Congress Street. The [illegible]

to the Financial, Government [illegible] Boston from the southeast. It [illegible] convenient connection between South Boston and [illegible] with other Commerce Street or the Surface Artery. [illegible] it would relieve the Central Artery of many short trips, thereby [illegible] trips to be closed and freeing Expressway capacity for [illegible] through trips.

[illegible]

Major [illegible] are [illegible] to [illegible] local [illegible] to provide for intermediate length [illegible] -- [illegible] -- and to provide a reserve of capacity [illegible]. One of the features of the plan is an attempt to provide [illegible] with continuous service roads or with a parallel [illegible] street.

The existing major street system is retained substantially in its present form, with some changes in classification, and with adjustments in areas affected by urban redevelopment, other [illegible], and major highway construction. Necessary improvements are indicated where warranted by traffic demands, circulation, [illegible] and [illegible].

The major [illegible] are discussed below approximately in the order of their relative importance to the [illegible] circulation pattern of the Region's Core area. Major arterials [illegible] North GNRP, while shown on the map, are not discussed, since [illegible] outside the study area.

Dover Street

Because Turnpike Extension [illegible] and the removal of the [illegible] Bridge across the railroad tracks, Dover Street will assume a more important role as an access from South Boston and the Southeast Expressway to the Park

Square and South Cove Streets.

The south service road [illegible] which will be [illegible] westbound, will provide a direct connection [illegible] traffic on Broadway, however, will [illegible] westbound service road. As a [illegible] discouraged. The best available [illegible] is via the South [illegible] and Dover Street which is presently [illegible].

There is an obvious need [illegible] Copley Square and Back Bay area [illegible] sign and location of the expressway [illegible] on the service road system. [illegible] the Southwest Extension, favor the use of Dover Street [illegible] also. [illegible], the South End Re[illegible] Project provides an opportunity for substantial improvement of Dover Street.

Dover Street, should be [illegible] as a two-way street with two lanes eastbound and three lanes westbound. In addition, a stopping lane in each direction and a median wide enough to provide left turn storage lanes at major intersections should be provided. The total width needed would be approximately 90 feet, curb-to-curb. Projected volumes are approximately 10,000 vehicles per day westbound and 10,000 vehicles per day eastbound.

Improvement of Dover St[illegible] as a two-way facility also would permit closing or de-emphasizing such local streets as Waltham Street and Dedham

Street in the South End.

Eastbound traffic [illegible] Dover Street by way of [illegible] the south service road of the Turnpike [illegible] to be widened in the South End. [illegible] Avenue and the south service road [illegible] don Street south of the service road.

Albany Street

The Central Artery [illegible] fic which can enter it from the [illegible] and the [illegible] Expressway. The most critical section is between the Inner Belt-Central Artery-South [illegible] pressway Interchange and Dover Street.

This problem can be [illegible] and the service road system of the [illegible] primary street. This route would [illegible] service road system of the Inner Belt on the south and with [illegible] Massachusetts Turnpike interchange to the north. It would [illegible] per day in the vicinity of the City Hospital and approximately [illegible] per day immediately south of Dover Street, where the ramp volumes from the Central Artery are additive to Albany Street traffic. These volumes will require three to four effective lanes in each direction.

To obtain full value from the improvement of Albany Street, the two "slip" ramps planned for the Inner Belt in the Roxbury area, which lead from

the Central Artery to the service [illegible] versed so that they lead from [illegible] provide traffic relief to the Cen[illegible] should allow a direct connection [illegible] Street.

Boylston-Beacon Co[illegible]

Through traffic in [illegible] Turnpike and Storrow Drive. [illegible] primary street in this area to connect [illegible] Parker Hill-Fenway area, and to provide [illegible] way system and from other major [illegible]

This function can best be [illegible] operating as a one-way couplet. [illegible] Boston to the Charlestown Bridge. [illegible] sive commercial development on [illegible] the Prudential Center. High rise [illegible] side of Beacon Street.

Commonwealth Avenue [illegible] stead of the Boylston-Beacon co[illegible] higher capacity than the one-way [illegible] Massachusetts Avenue. Actually [illegible] Street and marginal frictions in Kenmore Square [illegible]

tage of the underpass. The [illegible] cross-traffic [illegible] be [illegible] by the construction of a viaduct [illegible] Storrow Drive. However, the [illegible] will remain. Moreover, Com[illegible] den. It has no direct con[illegible] ter. With the develop[illegible] Back Bay, Commonwealth Avenue's [illegible] generators within Back Bay.

Strict land use and [illegible] wealth Avenue by the state [illegible] Bay was first developed. These restrictions [illegible] zoning regulations were originally [illegible] restrictions have been [illegible] Avenue. Trucks [illegible]

Land use [illegible] For maximum flexibility, [illegible] collector street from Arlington Street to Massachusetts Avenue. As a collector street it will provide [illegible] for future development. At the same time, extension [illegible] bility of property values [illegible] be unknowingly [illegible].

If the section of [illegible] Street between Arlington Street and Massachusetts Avenue should be included in a historic preservation district, the major street plan should be revised in the [illegible] area. Beacon Street should be

classified as a secondary [illegible] two-way, high-capacity arterial. [illegible] provision should be made for the [illegible] 80 feet between curbs. [illegible] would be needed for this purpose [illegible] necessary at Massachusetts Avenue. [illegible] the one-way scheme is much more practicable.

Kenmore Square Area

The area west of Massachusetts Avenue [illegible] Square is expected by the B.R.A. [illegible] district oriented toward Boston University, [illegible] Cambridge. Pedestrian traffic [illegible] expected to increase. Mass transit plans of the B.R.A. [illegible] station in the area. It is therefore expected that the capacity of Kenmore Square to handle vehicular traffic would be reduced [illegible] ment occurs.

Outbound traffic on [illegible] merges with traffic along Commonwealth Avenue. Inbound [illegible] Street, Brookline Avenue, and Commonwealth Avenue [illegible] Square. Cross traffic at Charles [illegible] Avenue and Beacon Street "meters" outbound traffic [illegible] capacity of Kenmore Square is not exceeded at present. Inbound traffic, however, backs up from Charles-

gate through Kenmore Square [illegible] moving the Charlesgate cr[illegible] ciencies to Kenmore Square.

An extension of Beacon [illegible] State Road, is proposed. [illegible] on a large 300 foot radius curve [illegible] angle, just west of the pre[illegible] wealth Avenue another large radius [illegible] fic onto the westbound lanes of the [illegible] setts Turnpike. This street [illegible] on Commonwealth Avenue is [illegible] be forced to stop on the incline. [illegible] a parking or turning lane [illegible] to curb width of 45 to 50 feet [illegible] will be necessary [illegible] facility will have to be c[illegible] the Kenmore Square area.

The pla[illegible] for the [illegible] arterial from the Bost[illegible] chusetts Avenue. East of [illegible] carries predominantly local traffic [illegible] While som[illegible] through traffic [illegible] Square

this volume would be substantially less than that now passing through the square.

Inbound traffic from Beacon Street would be routed via a new connection from Mountfort Street along the general alignment of Lansdowne Street and Ipswich Street to Boylston Street. This proposal would require a viaduct structure over the B & A Railroad siding and the proposed MTA rapid transit line. Some land taking also would be required for the improvement of Lansdowne and Ipswich Streets. The route should provide three moving lanes and a lane for parking or turning movements.

Projected traffic volumes for the Back Bay-Kenmore Square circulation system are approximately 20,000 vehicles per day on Commonwealth Avenue and approximately 15,000 vehicles per day on Beacon Street, Boylston Street and their connections. Design capacities are somewhat higher.

Should Beacon Street become unavailable for development as an arterial, the Bay State Road improvement will still be valuable as a connection from Massachusetts Avenue and the Charlesgate ramps on Storrow Drive to Common-Wealth Avenue and Beacon Street. It would be necessary to develop a connection from Boylston Street and Newbury Street westbound to Beacon Street west of Kenmore Square along the north side of the Turnpike.

For maximum flexibility in adapting to possible changes in land use policy, provision should be made in the design of the Charlesgate viaduct for connecting the two sections of Newbury Street in this area at some future

date. A minimum span of 40 feet between piers will be required, and 50 feet would be desirable.

Columbus Avenue

An improved arterial street is required to connect the South End with Downtown Boston on the north and the Parker Hill-Fenway and Roxbury North Dorchester GNRP area to the south. The South End development plan proposes to utilize Columbus Avenue, Warren Street, and Tremont Street for this purpose. This single route would replace the two present arterial streets, Tremont Street and Columbus Avenue. Since most of the northeast-southwest traffic in this area will be attracted to the Southwest Expressway Extension or the Inner Belt, a four lane street with provision for additional parking and turning lanes will ultimately be adequate.

Routing Columbus Avenue traffic via Warren Street will reduce conflicts and avert congestion in the Back Bay Station area where the Southwest Extension would connect into the Massachusetts Turnpike service roads, and would permit the Columbus Avenue Bridge to be used by the Southwest Expressway Extension if necessary. Until the Southwest Extension can be built, however, the proposed design of the Columbus Avenue-Warren route will be inadequate for present volumes.

Traffic demands in this interim period can best be provided for by operating Tremont Street and Columbus Avenue as a one-way couplet. Columbus Avenue would be one-way outbound from Arlington Street to Roxbury

Crossing. Tremont Street would be one way inbound from Roxbury Crossing to Stuart Street. After the Southwest Extension is built, Columbus Avenue between Clarendon Street and Warren Street, and Tremont Street from the Inner Belt Expressway to Warren Street would be available for local traffic service.

In the vicinity of the interchange of the Southwest Expressway and the Inner Belt, the location of Columbus Avenue depends on the ultimate location of the interchange. If the interchange can be located next to the railroad tracks, as desired by the Regional Core or inter-area planning staff of the B.R.A., it will be necessary to relocate Columbus Avenue to the east of the Whittier Street Housing Project. The reverse curves around the Whittier Street project and back into the Columbus Avenue Centre Street one-way couplet in the Jackson Square area must have a minimum radius of five hundred feet for satisfactory operation at normal urban arterial speeds. If the interchange is placed in the location recommended in the Inner Belt Study, Columbus Avenue can remain approximately on its present alignment as far south as the Jackson Square interchange complex.

Massachusetts Avenue

Massachusetts Avenue will continue to be an extremely important primary street in the Regional Core Area. It is direct in alignment and has a relatively uniform cross-section and traffic carrying capacity over much of its length. The major problem area lies between Commonwealth

Avenue and Huntington Avenue, including the intersections at both of these locations and at Boylston Street and Westland Avenue.

The abutting land use is predominantly commercial, with a considerable variety of establishments. The developments generate heavy pedestrian cross traffic and a substantial volume of delivery truck traffic. Curb parking facilities are also used to capacity. Traffic in this area also will be influenced by the Prudential Center and institutional expansion in the Northeastern University area. New land uses in the Fens and the Kenmore Square areas also will contribute additional traffic to Massachusetts Avenue.

The Inner Belt Expressway will undoubtedly relieve Massachusetts Avenue of the heavy through truck movement which now uses it, especially during off-peak periods when surplus capacity will be available on the expressway. However, Massachusetts Avenue has been operating at its possible capacity for several decades, and the capacity made available by diversion to the Inner Belt is likely to be absorbed by traffic attracted from more circuitous routes.

The most heavily traveled section of Massachusetts Avenue lies between Columbus and Westland Avenues. Minor improvements, such as removing the constrictions caused by the subway entrances at the Symphony MTA Station, making Westland Avenue one way eastbound, and relocating the taxi stand to the Huntington Avenue side of Symphony Hall, will substantially increase the traffic -carrying capacity of the street in this area.

Farther north, urban renewal should be used to develop rear servicing and parking for stores along Massachusetts Avenue. This will allow curb parking and loading to be eliminated without adverse impact on the stores. In the interim, peak hour parking restrictions should be extended to include loading and deliveries.

Other traffic controls, such as left turn prohibitions, can increase capacity without additional construction. Owing to signalization problems, however, peak hour average speeds will probably remain in the 10 to 15 mile hour range. If a substantial unbalance in traffic flow is ever observed on Massachusetts Avenue due to southbound traffic being diverted to the Charlesgate-Fenway-Westland Avenue alternate route, consideration should be given to off-center median striping in order to provide three moving lanes northbound at all times.

Physical improvements to Massachusetts Avenue will be made where it will pass over the New Haven Railroad and Southwest Expressway Extension. A partial interchange with the latter (permitting traffic movements to and from the south) is proposed at this location.

South of Washington Street in the South End, Massachusetts Avenue should be used as a one-way street northbound. Southbound traffic would follow a new diagonal transition to Northampton Street, which should be widened between Harrison Avenue and Albany Streets.

A major channelized intersection would be located at the junction of

Massachusetts Avenue, Albany Street, Southampton Street, and the service roads of the Inner Belt Expressway. This has also been mentioned in the discussion of Albany Street.

The present practical capacity of Massachusetts Avenue is approximately 20,000 vehicles per day at Boylston Street and about 25,000 vehicles per day in the South End. These volumes are now being substantially exceeded. The recommended minor physical improvements and new traffic controls could increase its practical capacity to approximately 35,000 vehicles per day. Projected volumes are approximately 25,000 vehicles per day at Boylston Street and 35,000 vehicles per day at Huntington Avenue, about the same as present volumes.

Charles Street and the "A", "B", "C" Streets

Charles Street and the "A", "B", "C" Streets (Arlington, Berkeley, and Clarendon Streets) will continue to increase in importance as primary cross-town streets in the area immediately west of Downtown, east of the growing Prudential Center-Copley Square complex.

They are presently the principal feeders to and from Storrow Drive, and will become even more important in this function when the direct Charlestown-Storrow Drive connection, included in the North Terminal proposals, becomes a reality. These streets also serve as important feeders to the Southeast Expressway via Broadway, Herald and Dover Streets. In addition, they will serve as feeders to both the Massachusetts Turnpike Extension and Southwest Expressway Extension via the proposed service roads paralleling

the Turnpike.

By retaining their present one-way pattern, adequate capacity can be made available on these streets, without street widening which would involve property acquisition. Widening of the pavement between curb lines will be necessary in several instances and strictly enforced curb parking regulating will have to be instituted. However, in this manner the character of the areas traversed by these streets will not be destroyed, as might be the case if major widening on a single street -- or a pair of streets -- were undertaken.

The connections to Storrow Drive, however, will need to be improved, particularly at Arlington Street where traffic must make a "jog" maneuver across Beacon Street, and at Berkeley Street where the present access road is extremely narrow.

The northbound connection between the Turnpike service roads and Charles street through the South Cove area will be largely on new alignment (known as the "Charles Street Extension"), generally following present Tremont and Carver Streets. This new street will to some extent provide traffic service now afforded by Broadway which is to be eliminated through the South Cove area.

Arlington Street traffic (southbound) will flow relatively directly into the south service road, while Dover Street traffic (northbound) can continue directly on Berkeley Street, or reach Charles Street via Tremont

Street and the Charles Street Extension. Southbound traffic on Clarendon Street will flow into the south service road to Berkeley Street. Berkeley Street should be widened for two-directional flow between the Turnpike Extension and Tremont Street to provide a direct continuation to widened Dover Street as discussed previously.

Dartmouth Street is not designated as a major arterial because it will not be a major carrier of through traffic. It will, however, continue to be an extremely important street, particularly in connection with the Copley Square interchange of the Turnpike, the Prudential Center, and other developments.

APPENDIX A

CLASSIFICATION OF STREETS
Regional Core and G. N. R. P. Area Traffic Studies

For the purpose of the general circulation plan that has been developed for the Regional Core Area of Boston and for the traffic studies of individual G. N. R. P. areas, the following classification of streets and highways was adopted. It includes freeways, expressways, major arterials, collector streets, and feeder streets. The Massachusetts Turnpike Extension is included in the freeway category.

Freeways

A freeway, more commonly referred to as an "expressway" in Massachusetts, is a divided arterial highway for through traffic with full control of access and grade separations at all intersections, generally with shoulders or auxiliary "break-down" lanes and with design speeds of 50-60 miles per hour. The Central Artery, the Southeast Expressway, the Mystic River Bridge-Northeast Expressway, the East Boston Expressway -- all are examples of freeways.

Expressways (At Grade)

Expressway at grade is a divided arterial highway for through traffic with full or partial control of access and generally with grade separations at major intersections. Storrow Drive, Soldiers Field Road, Morrissey Boulevard, portions

of the Arborway, and McClellan Highway in East Boston are examples of expressways at grade. Many of the existing examples of expressways of this type in the Boston area are designated as parkways and, therefore, prohibit commercial traffic.

Major Arterials

Major arterials are streets which will carry large volumes of through traffic in relation to the individual G. N. R. P. areas. They normally have divided roadways with four or six lanes of moving traffic; or they should be capable of ultimate development to such standards. Left turn storage lanes should be provided at all major intersections. Land service functions, such as parking and access to fronting properties, are considered subordinate to the traffic carrying function of these streets. Traffic volumes on these facilities will range from as low as 10,000 up to 40,000 vehicles per day. A minimum right-of-way of 100 feet is usually necessary for this class of street.

Collector Streets

Collector streets are streets of a more local nature which will carry substantial vehicle volumes, though primarily traffic generated within individual G. N. R. P. areas. Streets of this type should provide two continuously moving traffic lanes in the direction of heavier flow during peak periods. An 80-foot right-of-way is considered necessary. Typical traffic volumes range from 5,000 to 15,000 vehicles per day.

Feeder Streets

Feeder streets connect local land service streets with arterial and collector streets. Volumes are ordinarily less than 3,000 vehicles per day in residential areas while they may be somewhat higher in business and industrial districts. Streets of this type usually should have reasonable continuity over a distance of half a mile or more. They should provide one adequate moving lane in each direction in addition to parking lanes; the roadway therefore should be 40 feet wide. A minimum right-of-way of 60 feet is considered necessary to provide for snow removal, utilities, and street trees. Where widening to meet this standard would result in undue property damage, parking prohibitions must be used to provide an adequate level of service.

FREEWAYS, EXPRESSWAYS, AND MAJOR ARTERIALS
Boston Regional Core Area

FACILITY	FROM	TO	GNRP[1] AREA	PROPOSED CLASSIFICATION	AVG. SPEED PEAK[2] (m. p. h.)	TRAFFIC LANES	PAVEMENT WIDTH	RIGHT-OF-WAY	PROJECTED 1980 VOLUME AADT[3]	PRACTICAL CAPACITY AADT[4]	REMARKS
Massachusetts Turnpike Extension	Boston University Bridge	Massachusetts Avenue	Parker Hill-Fenway	Freeway	45	4+4	48+48	Varies	100,000	120,000	Toll Road. Two-foot curb offsets; Unbalanced flow.
	Massachusetts Avenue	Copley Square	Back Bay	"	40	4+4	44+44	"	97,000	120,000	Narrows through Prudential site; two-foot curb offsets;no shoulders.
	Copley Square	Central Artery	Downtown	"	40	3+3	36+36	"	60,000	90,000	Closely spaced on-ramps,westbound.
Inner Belt	Boston University Bridge	Southwest Expressway	Parker Hill-Fenway	"	45	4+4	48+48	"	140,000	140,000	Full shoulder. Balanced flow.
	Southwest Expressway	Southeast Expressway	South End	"	35	4+4	48+48	"	80,000	140,000	Capacity restraints on connections limit use.
Central Artery	Southeast Expressway	Massachusetts Turnpike	South End	"	20	3+3	36+36	250'	90,000	90,000	Should be operated eight lanes until inner belt is completed.
	Massachusetts Turnpike	Northern Avenue	Downtown	"	20	3+3	36+36	Tunnel	80,000	85,000	In tunnel, ramp changes required.
	Northern Avenue	State Street	Downtown	"	20	3+3	36+36	Elevated	100,000	100,000	On structure. Ramp changes required. Balanced flow.
Storrow Drive	Boston University Bridge	Charlesgate	Parker Hill-Fenway	Expressway (at Grade)	40	2+2	24+24	Varies	50,000	60,000	No shoulders. Unbalanced flow. Heavy off-peak usage.
	Charlesgate	Arlington	Back Bay	"	40	3+3	33+33	"	75,000	80,000	
Southwest Extension	Inner Belt	Massachusetts Avenue	Parker Hill-Fenway/South End	"	30	3+3	40+40	"	60,000	75,000	Along railroad. Capacity governed by at-grade intersections at north end.
	Massachusetts Avenue	Massachusetts Turnpike	South End/Back Bay	"	25	3+3	40+40	"	50,000	50,000	Grade intersection at West Newton Street.

(Continued)

Table 1 (Cont.)

FACILITY	FROM	TO	GNRP[1] AREA	PROPOSED CLASSIFICATION	AVG. SPEED PEAK[2] (m. p. h.)	TRAFFIC LANES	PAVEMENT WIDTH	RIGHT-OF-WAY	PROJECTED 1980 VOLUME AADT[3]	PRACTICAL CAPACITY AADT[4]	REMARKS
Boylston Street	Charlesgate	Massachusetts Avenue	Parker Hill-Fenway	Major Arterial	20	3+0	50'	Varies	12,000	20,000	One-way eastbound.
	Massachusetts Avenue	Arlington Street	Back Bay	"	20	3+0	50'	"	15,000	20,000	One-way eastbound.
	Arlington Street	Charles Street	Downtown	"	15	4+0	70'	"	20,000	30,000	One-way eastbound.
Mountfort-Boylston Connector	Beacon Street	Boylston Street	Parker Hill-Fenway	"	25	3+0	45'	"	20,000	25,000	Connects Beacon and Commonwealth to Boylston.
Beacon Street	Charles Street	Arlington Street	Downtown	"	20	3+0	46'	80'	20,000	20,000	One-way westbound.
	Arlington Street	Massachusetts Avenue	Back Bay	"	20	2+0	46'	80'	15,000	15,000	Parking both sides.
	Massachusetts Avenue	Commonwealth Avenue	Parker Hill-Fenway	"	20	3+0	50'	80'	15,000	20,000	New alignment.
	Commonwealth Avenue	Old alignment of Beacon Street	Parker Hill-Fenway	"	20	3+0	50'	80'	10,000	15,000	New alignment.
Massachusetts Avenue	Charles River	Huntington Avenue	Back Bay/Parker Hill-Fenway	"	15	2+2	60'	90'	25,000	28,000	Stronger traffic controls.
	Huntington Avenue	Albany Street	Back Bay/Parker Hill-Fenway/South End	"	20	3+3	80'	120'	35,000	40,000	Substantial widening.
Charles Street	Tremont Street	Boylston Street	Downtown	"	15	3+0	50'	80'	15,000	20,000	New alignment.
	Boylston Street	Beacon Street	Downtown	"	25	4+0	60'	100'	30,000	30,000	
Arlington Street	Beacon Street	Boylston Street	Back Bay	"	20	4+0	60'	80'	25,000	30,000	
	Boylston Street	Tremont Street	Downtown	"	20	3+0	50'	80'	15,000	20,000	

(Continued)

Table 1 (Cont.)

FACILITY	FROM	TO	GNRP[1] AREA	PROPOSED CLASSIFICATION	AVG. SPEED PEAK[2] (m. p. h.)	TRAFFIC LANES	PAVEMENT WIDTH	RIGHT-OF-WAY	PROJECTED 1980 VOLUME AADT[3]	PRACTICAL CAPACITY AADT[4]	REMARKS
Berkeley Street	Tremont Street	Herald Street	South End	Major Arterial	20	3+2	45+35	120'	30,000	35,000	Two-way unbalanced lanes
	Herald Street	Boylston Street	Downtown	"	20	3+0	50'	80'	20,000	25,000	One-way northbound.
	Boylston Street	Beacon Street	Back Bay	"	20	3+0	50'	80'	20,000	25,000	One-way northbound.
Clarendon Street	Herald Street	Beacon Street	Back Bay	"	20	3+0	36'	60'	15,000	20,000	One-way southbound.
Columbus Avenue	Inner Belt	West Newton Street	South End	"	20	2+2	70'	90'	20,000	25,000	
Warren Street	West Newton Street	Dover Street	South End	"	15	2+2	55'	80'	10,000	25,000	"No Standing." Peak hours
Tremont Street	Dover Street	Castle Street	South End	"	15	2+0	50'	80'	10,000	15,000	One-way northbound.
	Castle Street	Charles Street	Downtown	"	10	3+0	60'	90'	15,000	20,000	One-way northbound.

(1) GNRP Area - General Neighborhood Renewal Plan Area.
(2) Average Speed, miles per hour - During P.M. peak hour in heavier direction of traffic flow.
(3) AADT - Annual Average Daily Traffic.
(4) Practical Capacity expressed as equivalent annual average daily traffic volume; defined as the maximum number of vehicles per day which can pass a given point without unreasonable delay or restriction of the driver's freedom to maneuver in the 30th highest hour of the year.

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